

REMARKS

In the Final Office Action¹, the Examiner took the following actions:

rejected claims 2, 4-9, 13-15, and 21-24 under 35 U.S.C. § 103(a) as being unpatentable over Mashino et al. (U.S. Publication No. 2002/0190375 A1, "Mashino") in view of Mikawa et al. (U.S. Publication No. 2002/0115226 A1, "Mikawa");

rejected claims 10-12 under 35 U.S.C. § 103(a) as being unpatentable over Mashino in view of Mikawa and Mayashita et al. (U.S. Publication No. 2001/0045605 A1, "Mayashita"); and

rejected claims 16-20 under 35 U.S.C. § 103(a) as being unpatentable over Mashino in view of Mikawa and Sakao (U.S. Patent No. 6,166,425).

Applicant traversed the rejections and filed a Request for Reconsideration After Final and a Supplemental Request for Reconsideration After Final with the U.S. Patent and Trademark Office (USPTO) on June 22, 2006, and July 10, 2006, respectively. In an Advisory Action mailed July 21, 2006, the Examiner continued to reject claims 2 and 4-24.

Applicant continues to traverse the rejections and thus files this paper with the attached Request for Continued Examination to continue prosecution. Claims 1 and 3 were cancelled in a previous amendment, and thus claims 2 and 4-24 remain under examination.

Applicant respectfully traverses the rejection of claims 2, 4-9, 13-15, and 21-24. No *prima facie* case of obviousness is established based on Mashino and Mikawa.

To establish a *prima facie* case of obviousness, three basic criteria must be satisfied. First, there must be some suggestion or motivation, either in the references

¹ The Office Action contains a number of statements reflecting characterizations of the related art and the claims. Regardless of whether any such statement is identified herein, Applicants decline to automatically subscribe to any statement or characterization in the Office Action.

themselves or in the knowledge generally available to one of ordinary skill in the art, to modify a reference or to combine references. Second, there must be a reasonable expectation of success. Third, the prior art reference (or references when combined) must teach or suggest all of the claim elements. See M.P.E.P. § 2143. Moreover, the requisite teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in Applicant's disclosure. See *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991). See M.P.E.P. § 706.02(j).

Here there is a no suggestion or motivation to combine the references in the manner proposed by the Examiner. For example, the prior art fails to provide a suggestion or motivation to modify Mashino based on Mikawa such that "a through plug [is] formed to be partly surrounded by the diffusion layer patterns . . . and to pass through the diffusion layer patterns and the semiconductor substrate," as recited in claim 2.

Even assuming *arguendo* that a modified Mashino based on Mikawa taught all of the claimed elements of the "through plug," recited in claims 2, 7, or 9, to which Applicant does not acquiesce, the Examiner has not, and Applicant respectfully submits **cannot, point to a suggestion or motivation** to combine the references in the Examiner's proposed manner. Instead, the Examiner only offers a broad generalization that "one of ordinary skill in the art [would combine Mashino and Mikawa] . . . in order to realize a ferroelectric memory device," in support of his proposed combinations with respect to independent claim 2 at page 4 of the Final Office Action, and similar assertions at pages 5 and 7 of the Final Office Action with respect to independent claims 7 and 9.

The Examiner's assertions are an improper basis for rejection under 35 U.S.C. § 103. "A statement that modifications of the prior art to meet the claimed invention would have been 'well within the ordinary skill of the art' at the time the claimed invention was made' because the references relied upon teach that all aspects of the claimed invention were individually known in the art **is not sufficient to establish a *prima facie* case of obviousness without some objective reason to combine the teachings of the references.**" M.P.E.P. §§ 2143.01(IV) (citation omitted, emphasis added). "General conclusions concerning what is 'basic knowledge' or 'common sense' . . . without specific factual findings or some concrete evidence in the record to support these findings will not support an obviousness rejection." M.P.E.P. §§ 2144.03(B), emphasis added. Instead, "[o]bviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art." M.P.E.P. §§ 2143.01(I) (emphasis added).

Here the Examiner relies on the very type of broad assertion and unsupported conclusion warned against, that one of ordinary skill of the art would be motivated to combine Mashino and Mikawa "in order to realize a ferroelectric memory device." Final Office Action at 4. There is no teaching, suggestion, or motivation taught in the prior art to make the Examiner's proposed modification. Furthermore, the Examiner's assertion lacks the very specific factual findings or concrete evidence required to establish a *prima facie* case of obviousness.

Accordingly, Applicant respectfully requests that the Examiner cite to specific portions of the prior art in support of his contention that one of ordinary skill would be

motivated to “realize a ferroelectric memory device,” take Official Notice without documentary evidence as provided for by M.P.E.P. §§ 2144.03(A), or withdraw the rejections of claims 2, 7, and 9 for at least this reason.

Moreover, Applicants remind the Examiner that no *prima facie* case of obviousness can necessarily be established if any proposed modification of a reference “render[s] the prior art invention being modified unsatisfactory for its intended purpose . . . [or] change[s] the principle of operation of the prior art invention being modified.” M.P.E.P. §§ 2143.01(V-VI) (citation omitted).

Neither Mashino nor Mikawa teach or suggest how heavily doped diffusion layers 11a or isolation insulating films 12 would be provided to conductor 217 taught by Mashino such that the combination would produce the claimed “through plug formed to be partly surrounded by the diffusion layer patterns without being in contact with the insulation film and to pass through the diffusion layer patterns and the semiconductor substrate,” as recited, for example, in claim 2. In addition, Mashino discloses a diameter of through hole 212 in which conductor 217 is **formed is on the order of tens of micrometers** as shown in FIGS 2A-2D of Mashino. In contrast, Mikawa discloses a distance from an arbitrary position on the upper surface of lower electrode 15 to a nearest end portion thereof is about 0.6 micrometers or less. See, for example, claim 1 of Mikawa. In paragraph [0045] of Mikawa, the reference discloses lower electrode 15 has sides of 1.0 micrometers. Therefore, Mikawa teaches heavily doped diffusion layers 11a, each of which is respectively accompanied with the lower electrode 15, **formed on the order of micrometers**.

One of ordinary skill in the art would thus not combine the micrometer scale ferroelectric memory device taught by Mikawa with the tens of micrometer scale

conductor 217 taught by Mashino at least because the conductor 217 would **necessarily be in contact** with heavily doped diffusion layer 11a and insulation films 12 of Mikawa. Any such modification would thus **render the prior art invention being modified unsatisfactory for its intended purpose** or **alter the method or mode of operation** of at least one of the references.

Accordingly, the Examiner's proposed modification of Mikawa based on Mashino is not sufficient to establish a *prima facie* case of obviousness with respect to claim 2. Claims 7 and 9 recite a semiconductor device and require a "through plug," which though of different scope than claim 2, recites similar limitations in this regard. The Examiner's proposed modification of Mashino base on Mikawa to meet the "through plug" recited in claims 7 and 9 would thus also fail to establish a case of *prima facie* obviousness for reasons similar to those discussed above with respect to claim 2.

No *prima facie* case of obviousness is established with respect to independent claims 2, 7, and 9, because any combination of Mashino and Mikawa fails to meet not just one, but **all three requirements to establish a prima facie case of obviousness**. As discussed above, there is no suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify a reference or to combine references. Similarly, the Examiner's proposed combination fails to support a reasonable expectation of the success of his proposed combination as discussed above. Finally, as discussed in earlier filed papers in this application by Applicant, Mashino and Mikawa, either alone or in combination, also fail to teach or suggest the claimed "thorough plug" and all its limitations recited in claims 2, 7, or 9.

Claims 4-6, 8, 13-15, and 21-24 depend from their corresponding independent claim 2, 7, or 9, and thus incorporate each and every element recited in their corresponding independent claim. Claims 10-12 and 16-20 are therefore also allowable at least due to their dependence from their corresponding independent claim. In light of the above remarks, Applicant respectfully requests that the Examiner withdraw the rejection of claims 2, 4-9, 13-15, and 21-24.

Applicant respectfully traverses the rejection of claims 10-12 under 35 U.S.C. § 103(a) as being unpatentable over Mashino, Mikawa, and Mayashita. Claims 10-12 depend from independent claims 7, 2, and 9, respectively, and thus incorporate each and every element recited in each of their respective independent claims. As set forth above, claims 7, 2, and 9, the prior art fails to teach or suggest a motivation or suggestion to combine the references in the Examiner's proposed manner. Mayashita discloses a "semiconductor device of a MIS" structure (paragraph [0001]), but fails to teach or suggest the claimed "through plug" recited in claims 7, 2, and 9, and required by claims 10-12. Even assuming *arguendo* that all of the elements recited in claims 2, 7, or 9, were taught by Mashino, Mikawa, and Mayashita, and Applicant does not agree that all elements are taught by the cited references, neither Mayashita in particular, nor the prior art in general, provide the requisite motivation required for the Examiner's proposed combination. Thus, Applicant respectfully requests the Examiner reconsider and allow claims 10-12.

Applicant respectfully traverses the rejection of claims 16-20 under 35 U.S.C. § 103(a) as being unpatentable over Mashino, Mikawa, and Sakao. Claims 16-20 depend from corresponding independent claims 2, 7, or 9. As set forth above, the prior art fails to teach or suggest a motivation or suggestion to combine or modify

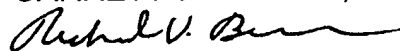
the references in the Examiner's proposed manner. Sakao is drawn to a "semiconductor device including a MOS transistor and a resistance element with a large resistivity." Col. 1, lines 7-9. However, Sakao also fails to teach a suggestion or motivation to combine the references in the proposed manner. Thus, even assuming *arguendo* that all of the elements recited in claims 2, 7, or 9, were taught by Mashino, Mikawa, and Sakao, and Applicant does not agree that all elements are taught by the cited references, neither Sakao in particular, nor the prior art in general, provide the requisite motivation required for the Examiner's proposed combination. Thus, Applicant respectfully requests that the Examiner reconsider and withdraw the rejection of claims 16-20.

Should the Examiner continue to disagree with Applicant after consideration of this paper, Applicant respectfully urges the Examiner to contact Applicant's representative prior to issuing his response, in order to allow Applicant an opportunity to interview with the Examiner. Applicant's representative in this matter may be contacted at (202) 408-4018 at the Examiner's convenience. (Contact information is provided for Robert E. Converse, Jr., (Reg. No. 27,432) who is an attorney of record in this application).


Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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